

# Small-Diameter Timber on Display at 2002 Winter Olympics

USDA Forest Service  
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Technology Marketing Unit  
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In an effort to provide assistance with forest restorations in the West, the Forest Products Laboratory (FPL) has been exploring the concept of using small-diameter softwood timber to build roundwood structures.

To demonstrate this small-diameter concept, FPL has been working with National Forests and forestry-dependent communities to build two roundwood demonstration structures that will be displayed as information kiosks at the 2002 Winter Olympics in Salt Lake City, Utah.

## Background

Throughout the West, our National Forests face an increased risk of catastrophic wildfire because of an overabundance of dense, overstocked forest stands. This situation resulted from more than 50 years of fire exclusion. To restore the open, park-like settings that existed in pre-settlement times, these stands need thinning. Such restoration is expensive, but if economic uses can be found for this thinned, small-diameter and low-value material, some costs could be offset.

In the past, processing 3- to 6-inch diameter roundwood material at breast height (dbh) was very expensive. Only about 40% of the material was used, and the juvenile core (which is considerably weaker than old-growth material) was left exposed. However, if the timber is left in the round form, rather than sawing it into lumber, it retains more of its strength, processing costs could be minimized, and the economics of forest restoration could be improved.

## Community Sponsor/Location

Wallowa Resources and Bronson Log Homes, located in Enterprise, Oregon, built one kiosk. This kiosk will be located inside the 2002 Soldier Hollow venue (near Heber), where the biathlon and cross-country skiing events take place. This kiosk will serve as a visitor center for the America's Public Lands coalition, which includes the Forest Service, Bureau of Land Management, National Park Service, and Utah Division of Parks & Recreation. After the Olympics, this kiosk will be returned to the community of Enterprise, Oregon.

The second kiosk was built by the Bitterroot Resource Conservation and Development (RC&D) Council and Porterbilt Post & Pole, owned by Ron Porter and located south of Hamilton, Montana. (This community was hit hard by the devastating forest fires of 2000.) Located at the mouth of Ogden Canyon, this kiosk will serve as an information center for the Bonneville Shoreline Trail System, the Ogden River Scenic Byway, and other recreation opportunities on the Wasatch-Cache National Forest and within Weber County and Ogden City. After the Olympics, this kiosk will become a permanent structure in Utah and continue to be used by the community.

The information kiosks were shipped unassembled from their respective communities to the Olympic sites. Shortly after arrival, the kiosks were reconstructed and installed. Each kiosk is approximately 25 feet in diameter, and the average diameter of the round timbers in the roof trusses is 5 inches. Harman Stove Company is providing the pellet stove that will heat the enclosed kiosk at Ogden Canyon.

In addition to providing heated visitor information centers, these kiosks contain descriptive exhibits that highlight the stewardship efforts of the sponsoring communities and the small-diameter timber technology used to create them.



## Additional Information

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## Sponsorship

- USDA Forest Service, S&PF Technology Marketing Unit, Forest Products Laboratory
- USDA Forest Service, Intermountain Region, 2002 Planning Team, Salt Lake City, UT
- Porterbilt Post & Pole, Hamilton, MT
- Bitterroot RC&D Council, MT
- Bitterroot National Forest, Darby, MT
- Bronson Log Homes, Enterprise, OR
- Wallowa Resources, Enterprise, OR
- USDA Forest Service, Pacific Northwest Region (R-6), National Forest Plan Community Assistance
- Beaudette Consulting Engineers, Inc., Missoula, MT
- Western Governor's Association, Denver, CO
- Ogden City, UT
- Ogden Ranger District, Wasatch-Cache National Forest, UT
- Harman Stove Company, Halifax, PA
- Forest Service Old Timers Club, Ogden, UT
- Weber Pathways, Ogden, UT
- Rainbow Gardens Corp., Ogden, UT
- Ogden-Weber Convention & Visitors Bureau
- Utah Power and Light, Ogden, UT
- Healthy Forests, Healthy Communities Partnership, Portland, OR
- Wasatch Mountain State Park, Heber, UT

## Construction Information

Building with round logs is not a new concept—our forefathers used large (>10 inches) round logs to build their dwellings. These structures were labor intensive and inefficient in the use of the wood resource. So, what is different from the way our forefathers built log buildings? Today, these structures use smaller diameter round timbers, have new fastening systems and connections, and are analytically engineered to meet the performance specifications. These small-diameter roundwood trusses, through engineering design, balance more closely the required wood resource with the required structural performance. These roundwood structures are less labor intensive, more efficient in the use of the wood resource, and still have the equivalent load capacity of the large round timbers used historically. For example, current roundwood structures can carry more than 100 lb/ft<sup>2</sup> of snow load, equivalent to 20 feet of fresh snow or almost 2 feet of solid ice.

This informational kiosk is approximately 25 feet in diameter. The strength of this structure comes from the connections between the 5- and 6-inch-diameter timbers. Steel plates, 1/4 or 3/8 inch, are placed into slots cut in the timbers. These plates are bolted with 5/8-inch steel bolts so that the structure can be disassembled and then re-assembled. The trusses connect to the center hub ring with a dowel nut connection. This connect consists of a 5/8-inch rod that threads into a 4-inch-long steel dowel. Two holes are drilled into the end of the truss—a large perpendicular hole for the dowel and a smaller center hole, parallel to the member, for the threaded rod.

Another new technology used in the kiosk is the structural insulated panels, which make up the floor and roof panels. In structural insulated panels, styrofoam is sandwiched between two layers of particleboard. This provides greater insulation capability and simplified installation. The kiosk walls are traditional 2- by 4-inch boards, with plywood on each side. Batons are applied to simulate baton-on-board siding. Treated lumber or cedar is used where the structure comes in ground contact. The roof is cedar shakes.

Advantages of using the smaller diameter round timber versus rectangular lumber made from small-diameter material is that processing costs are minimized, the maximum strength is obtained, and the material properties can be fully accounted for with engineering analysis.

In addition to these visitor information kiosks, other structural designs are being developed that will use small-diameter round timbers, such as in a 60- by 35-foot building that will house the Forest Service Museum in Missoula, Montana.

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